Twenty new prize contest

Small House Plans



Twenty New Prize Contest Small House Plans

With Bonus Basements that Bituminous Coal Can Buy

THERE ARE TWENTY PLANS for small houses presented in this book. You will find them of interest and, it is hoped, of help in your home planning, now that the war is over.

Here are the plans that received the prizes and honorable mention in the small homes planning contest for architects sponsored by the Bituminous Coal Institute. The contest closed and the entries were judged less than a year ago. So the designs are new, fresh, and inspiring.

Each envisions a home in the size and price range suited to the moderate budget. In these plans you will find many exciting new ideas—particularly in basement design and use.

Not so long ago, the cellar of even a handsome home was apt to be hardly more than a bare, dark, unfriendly place whose chief purpose was to harbor a heating plant—and to hide broken furniture, garden tools, and other household "Cinderellas."

But, with the development of automatic heating equipment, the cellar suddenly became a "basement," and part of the basement in turn became a "rumpus room," a "recreation room," a "play room," or a "hobby room."

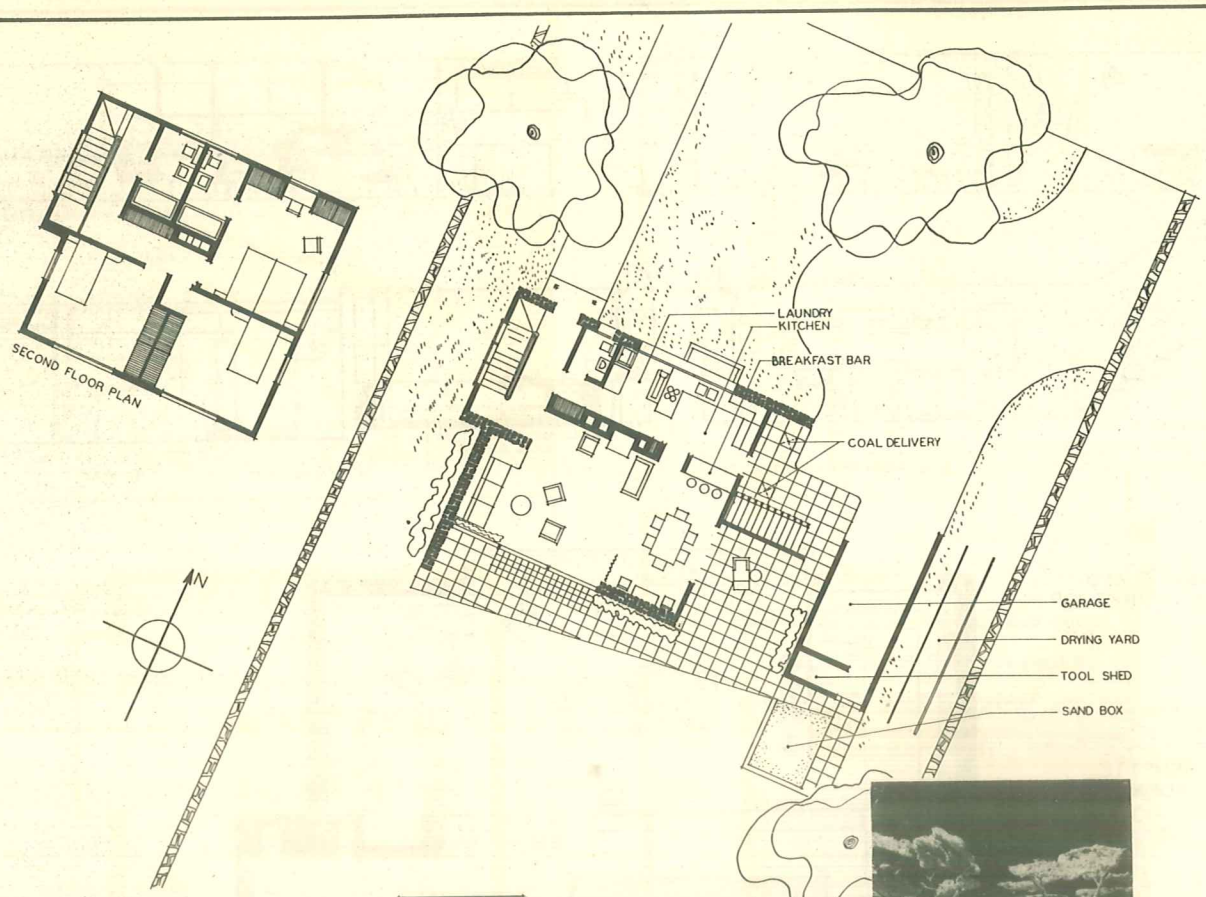
So today, the basement has become an essential part of the home insofar as its usefulness, its attractiveness, and its importance as room-space are concerned.

Indeed, one of the major thrills of planning a new home lies in deciding just what *kind* of a basement to have and just how to furnish and equip it.

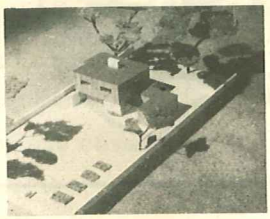
The purpose of this book is to give you a wide variety of ingenious ideas and practical suggestions.

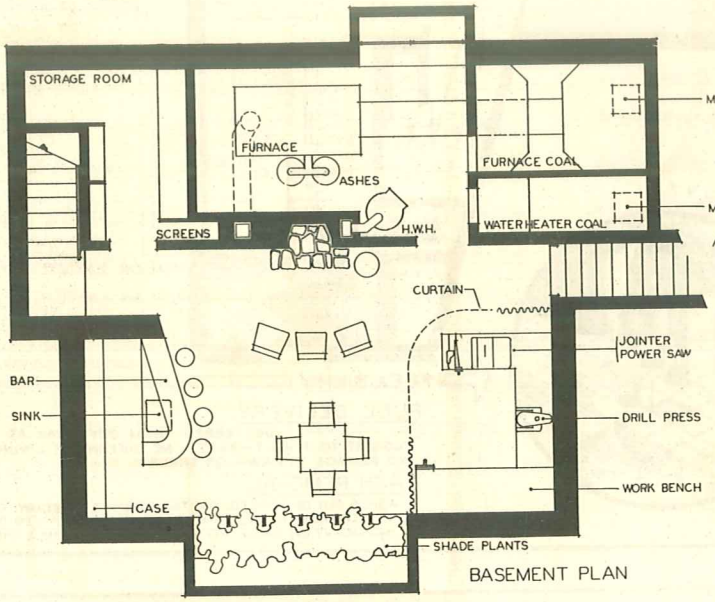
More than that, it also tells how you can get an ideal basement in your new home on just about the best terms imaginable. For, you can have a "*BONUS BASEMENT*"—furnished and paid for by the savings that can come from heating your home with Bituminous Coal.

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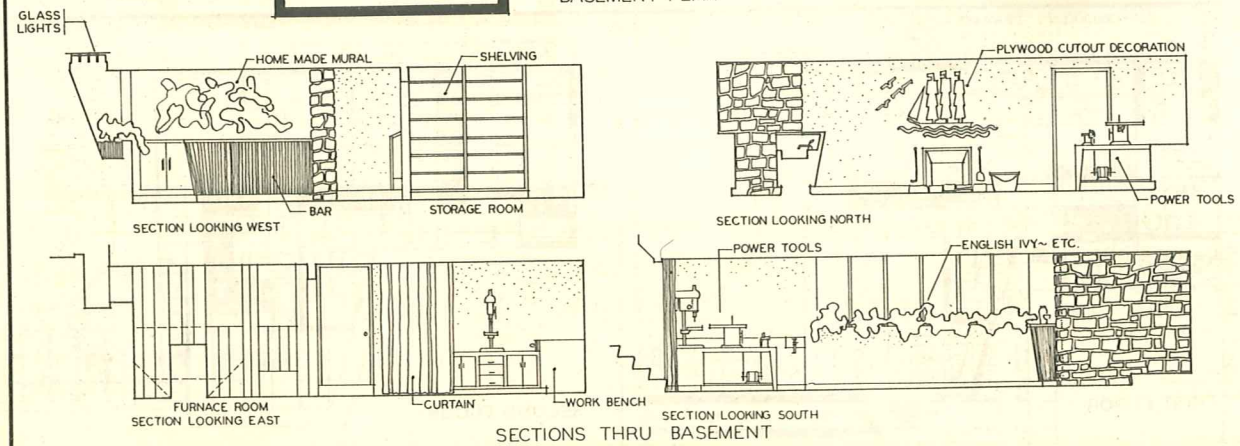








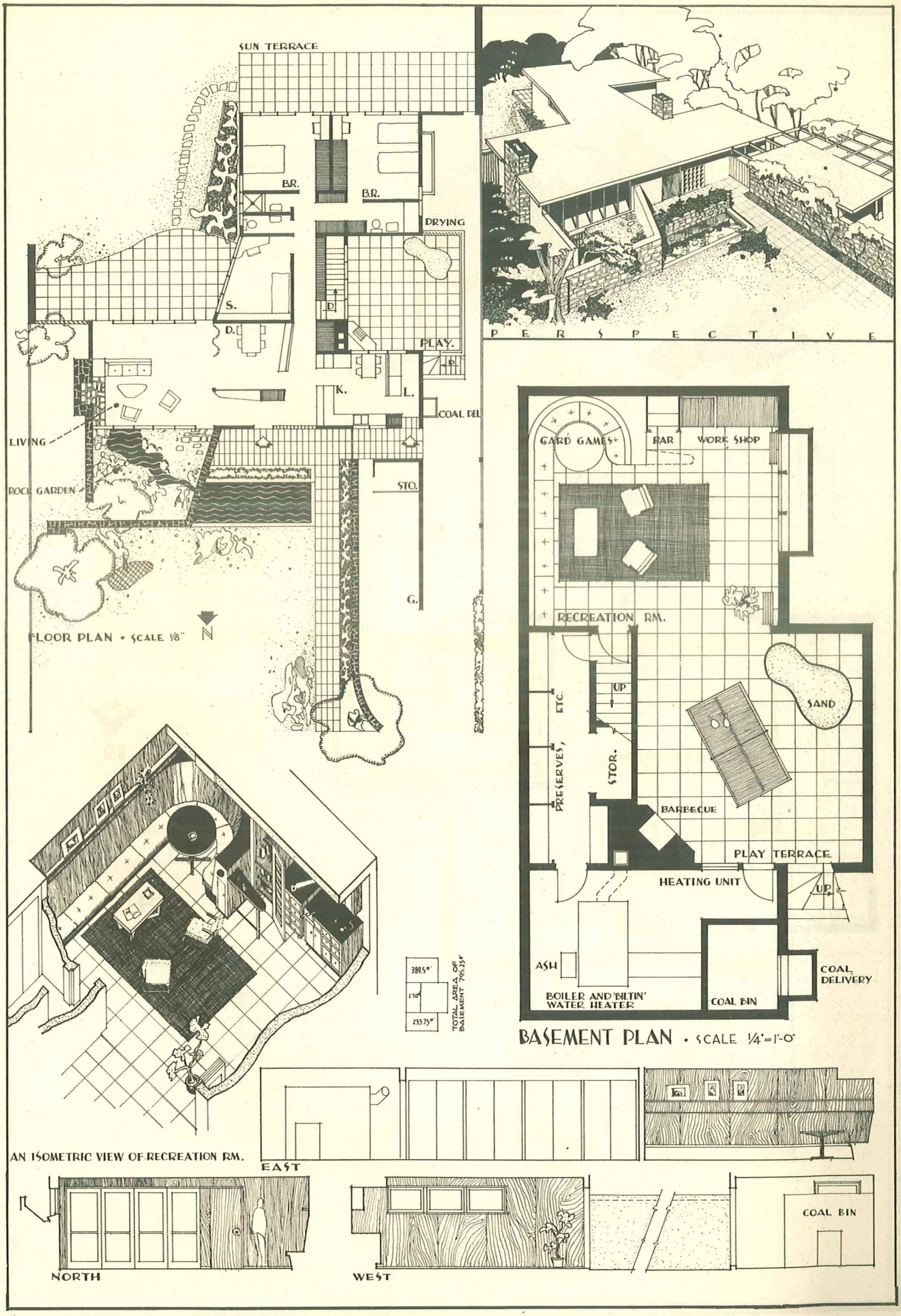
BASEMENT PLAN



SECTIONS THRU BASEMENT

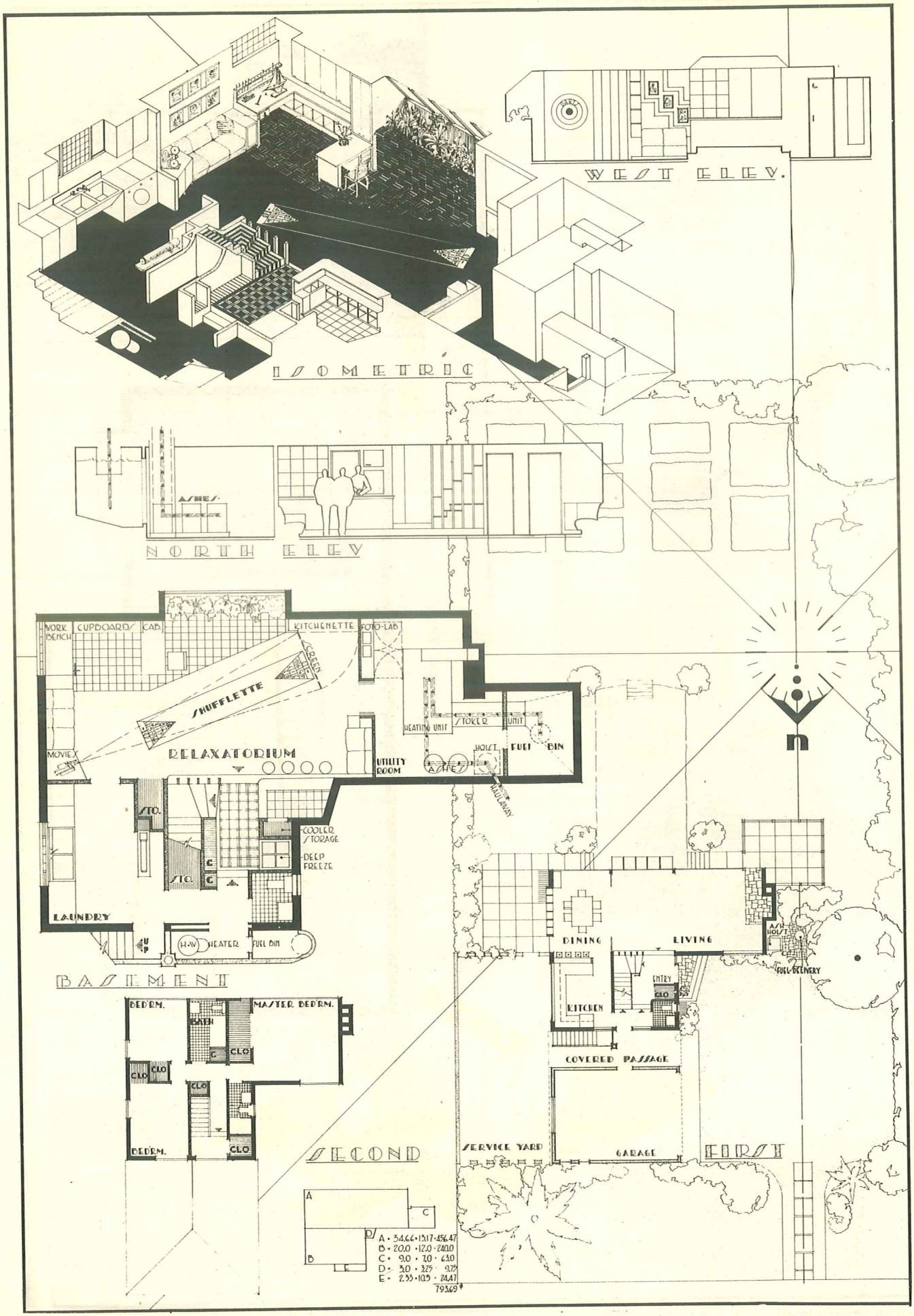
SECOND PRIZE WINNER

Architect: STEPHEN J. ALLING, CINCINNATI, OHIO



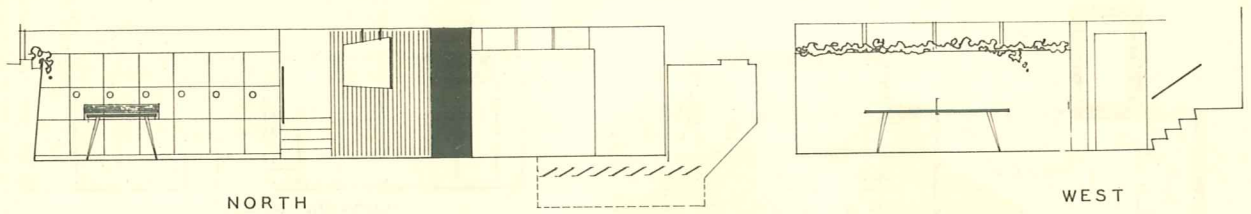
THIRD PRIZE WINNER

Architect: KENNETH M. NISHIMOTO, RIVERS, ARIZONA



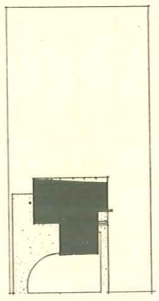
HONORABLE MENTION

Architect: FREDERICK W. STRITZEL, COLUMBUS, OHIO



NORTH

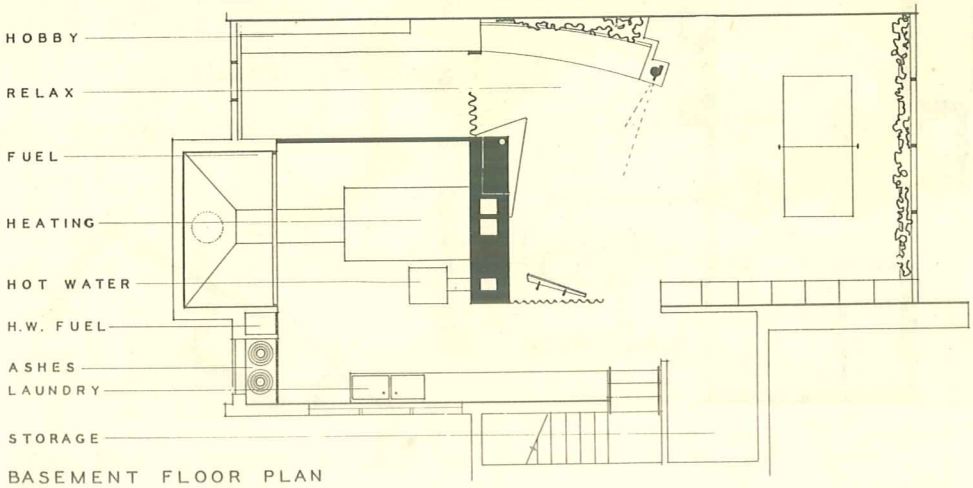
WEST



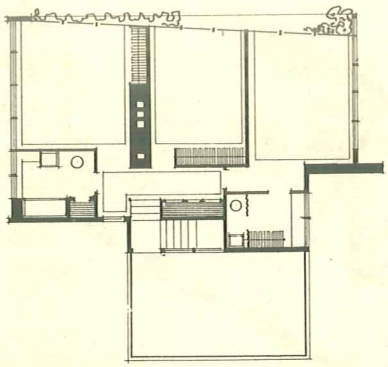
PLOT PLAN



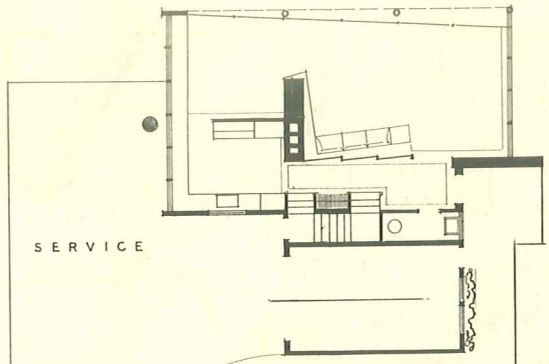
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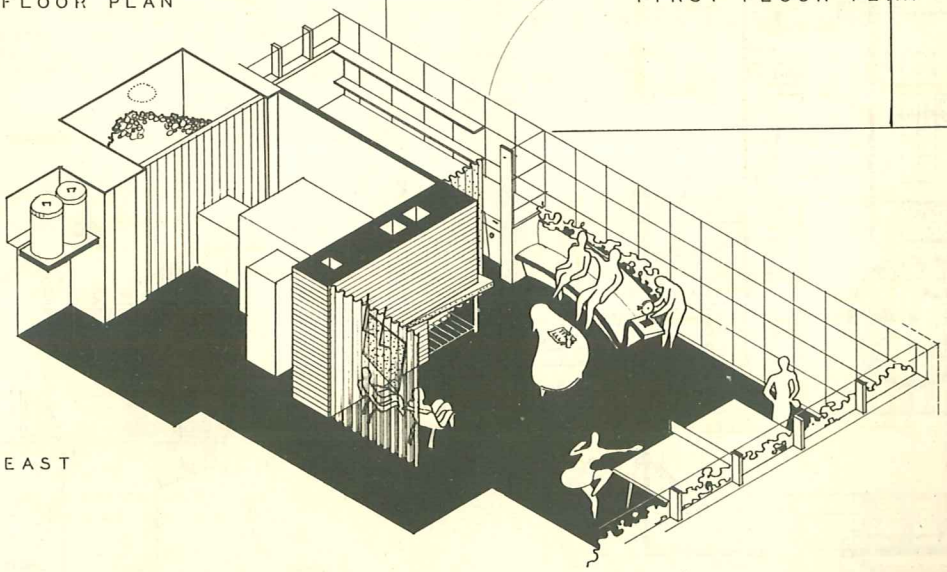
BASEMENT FLOOR PLAN



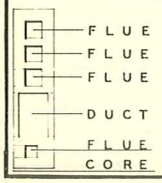
SECOND FLOOR PLAN



FIRST FLOOR PLAN

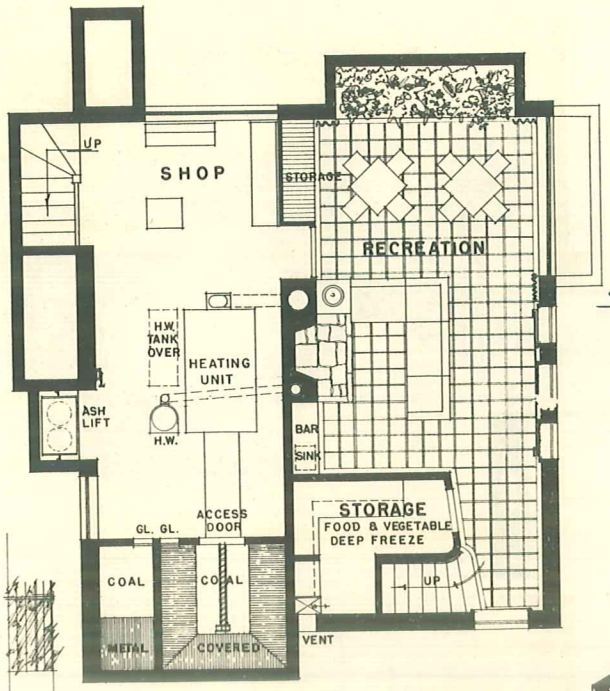


SOUTH - EAST



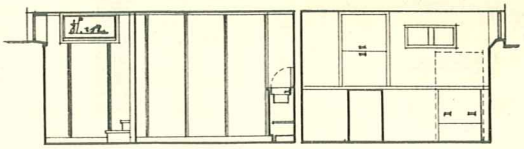
HONORABLE MENTION

Architects: LEE CHARLES MIELKE *and* LAWRENCE LATTIN SMITH, CHICAGO, ILLINOIS

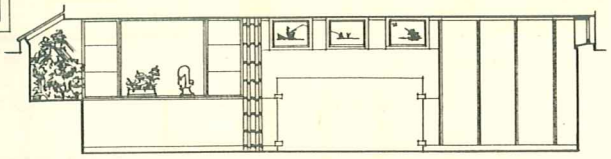


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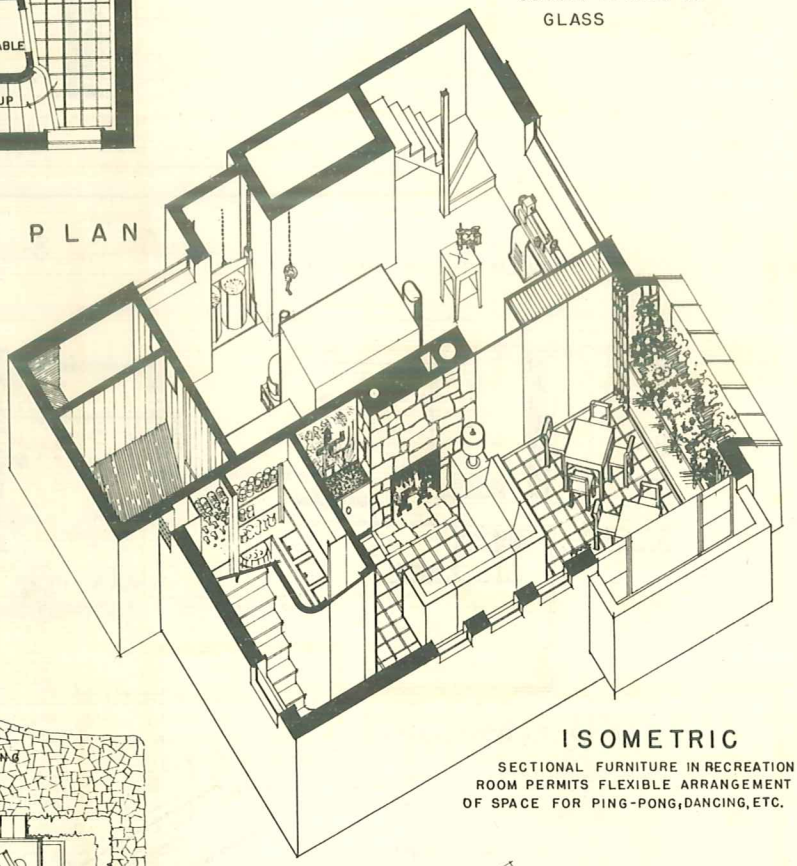
SCALE $\frac{1}{4}$" = 1'-0"



LOOKING NORTH

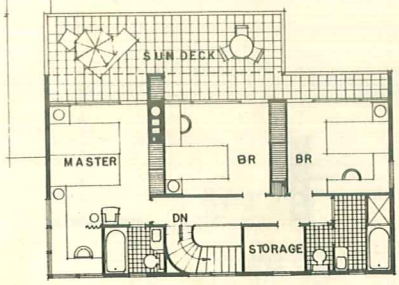


LOOKING WEST PING-PONG TABLE AT WALL- SPORT SCENES ETCHED ON GLASS



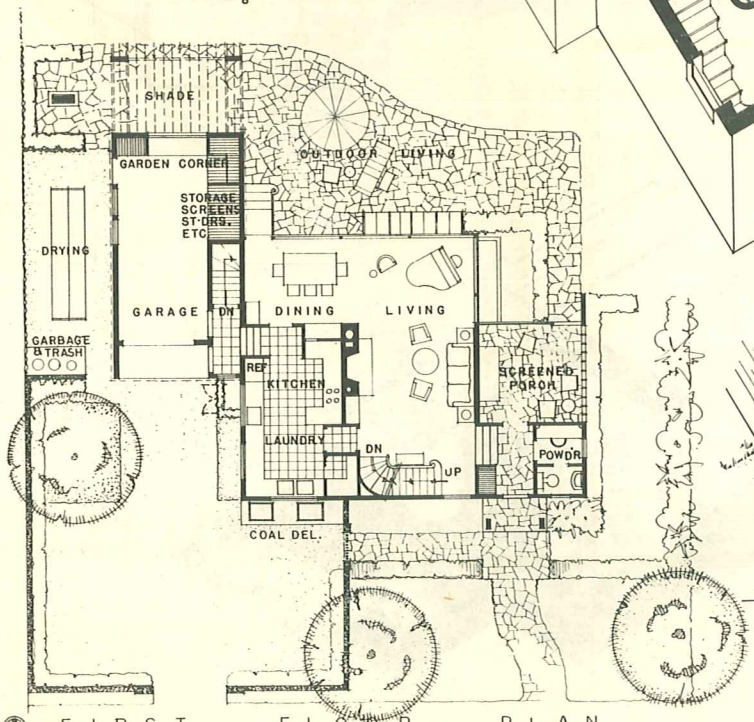
ISOMETRIC

SECTIONAL FURNITURE IN RECREATION ROOM PERMITS FLEXIBLE ARRANGEMENT OF SPACE FOR PING-PONG, DANCING, ETC.



SECOND FLOOR PLAN

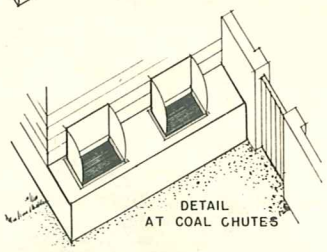
SCALE $\frac{1}{8}$" = 1'-0"



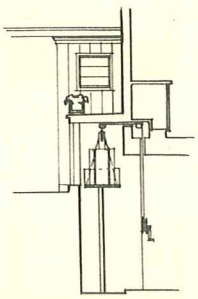
FIRST FLOOR PLAN

SCALE $\frac{1}{8}$" = 1'-0"

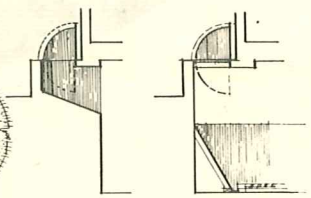
N



DETAIL AT COAL CHUTES



DETAIL AT ASH LIFT— PIPE SLEEVE THRU' WALL AND FLOOR FOR CHAIN

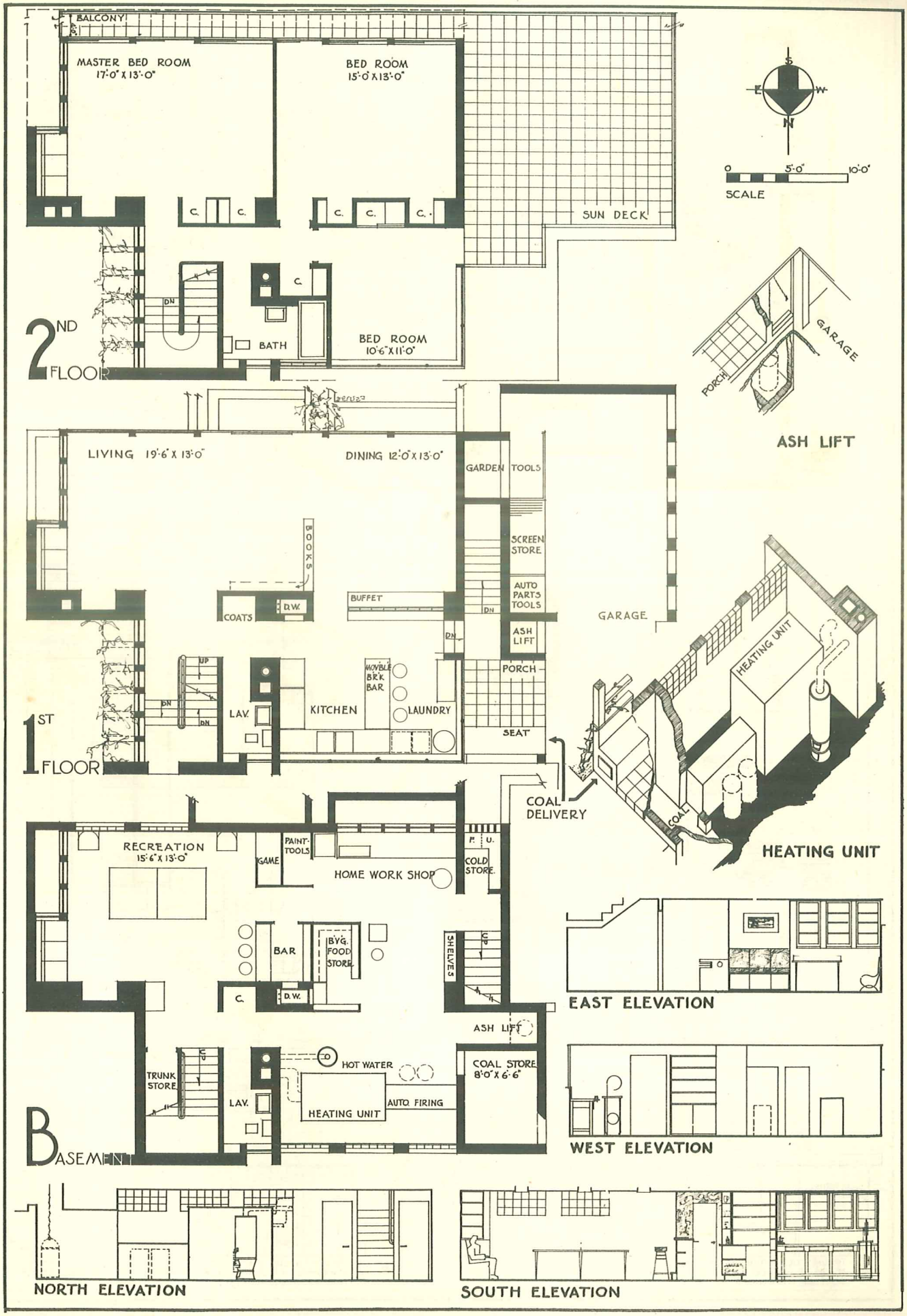


AT SMALL BIN AT LARGE BIN

BIN CAPACITY ALLOWS 2' FOR TRIMMING

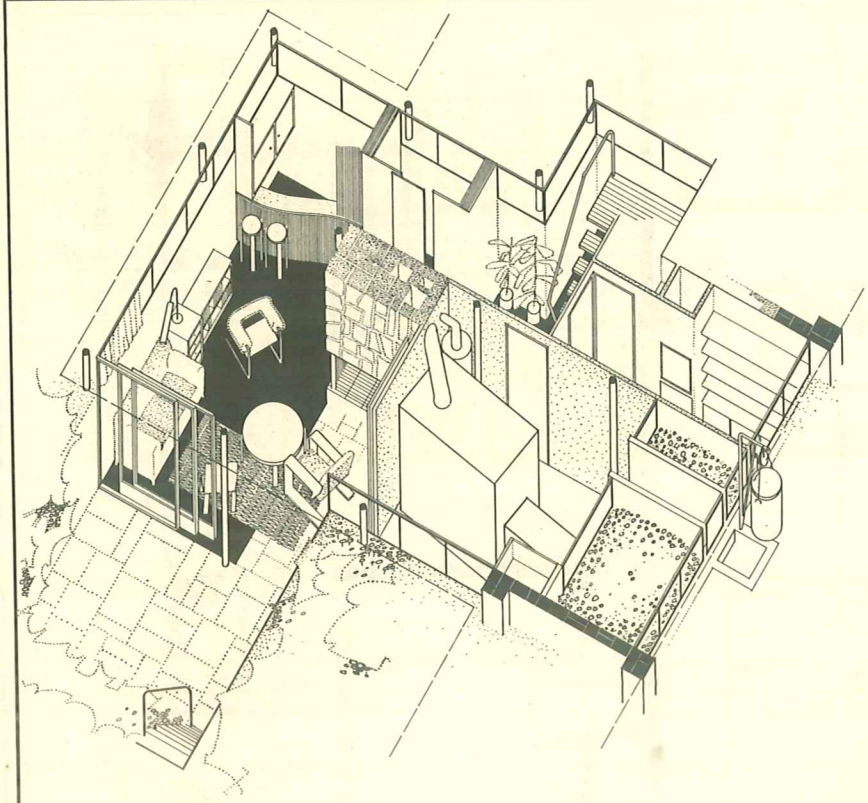
HONORABLE MENTION

Architect: FREDERICK W. WESTMAN, MILTON, MASSACHUSETTS

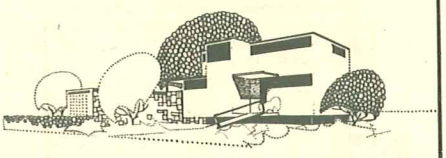


HONORABLE MENTION

Architect: WILLIAM G. MOECKEL, WILMINGTON, DELAWARE



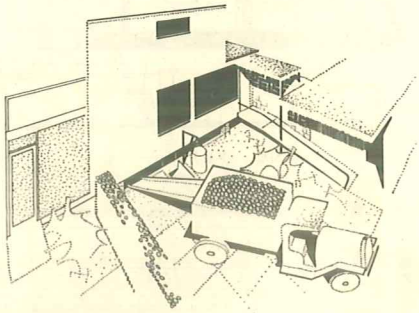
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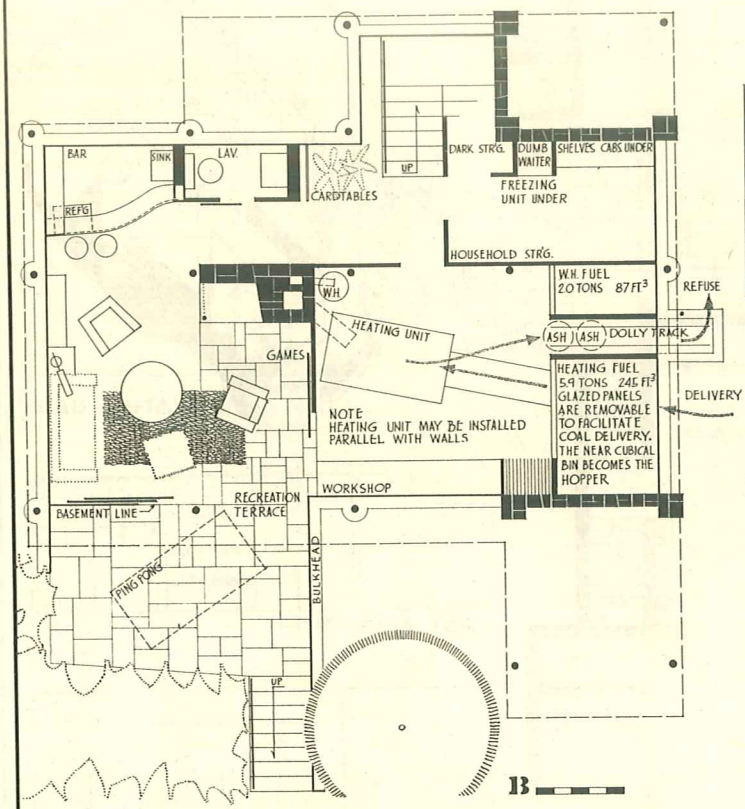
PUBLIC VIEW



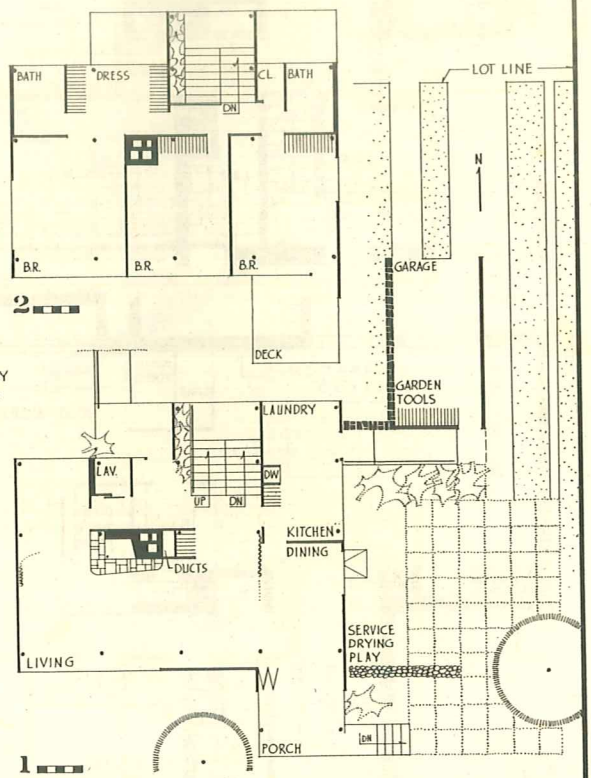
PRIVATE VIEW



SERVICE VIEW

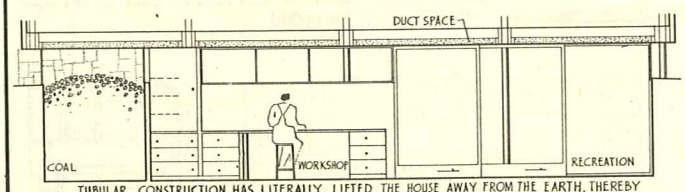


B



2

1



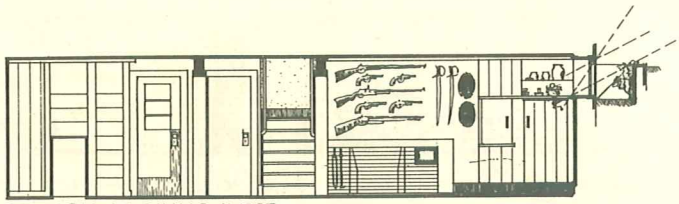
S TUBULAR CONSTRUCTION HAS LITERALLY LIFTED THE HOUSE AWAY FROM THE EARTH, THEREBY FILLING THE BASEMENT WITH SUNSHINE. THE SMALL SPANS BETWEEN MAJOR BEAMS AFFORD SPACE FOR FLEXIBILITY OF DUCT INSTALLATION.



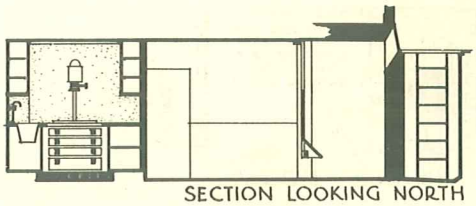
E SINCE THERE ARE NO LOAD BEARING WALLS, EXTERIOR WALLS NEED ONLY BE A MINIMUM INSULATING SHELL. THE RECREATION ROOM AND ADJOINING TERRACE INTRODUCE FLEXIBILITY AND SPACIOUSNESS RARE IN BASEMENTS.

HONORABLE MENTION

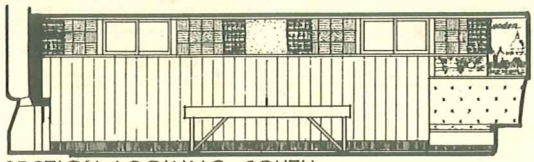
Architect: ROBERT A. DESHON, FORT WORTH, TEXAS



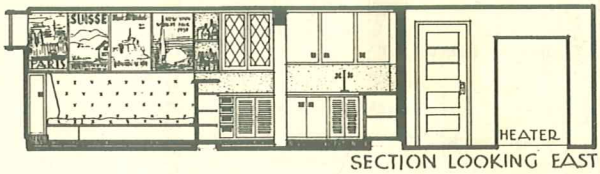
SECTION LOOKING WEST



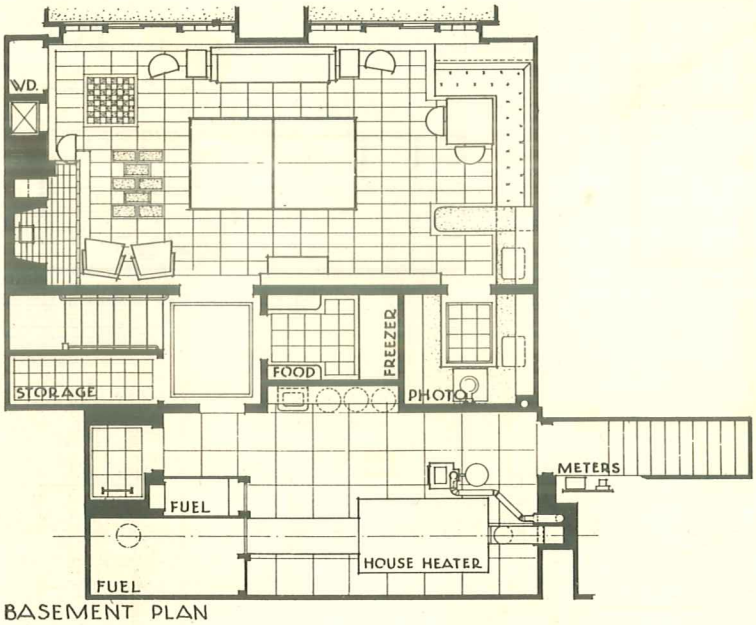
SECTION LOOKING NORTH



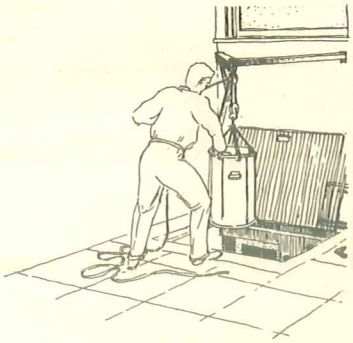
SECTION LOOKING SOUTH



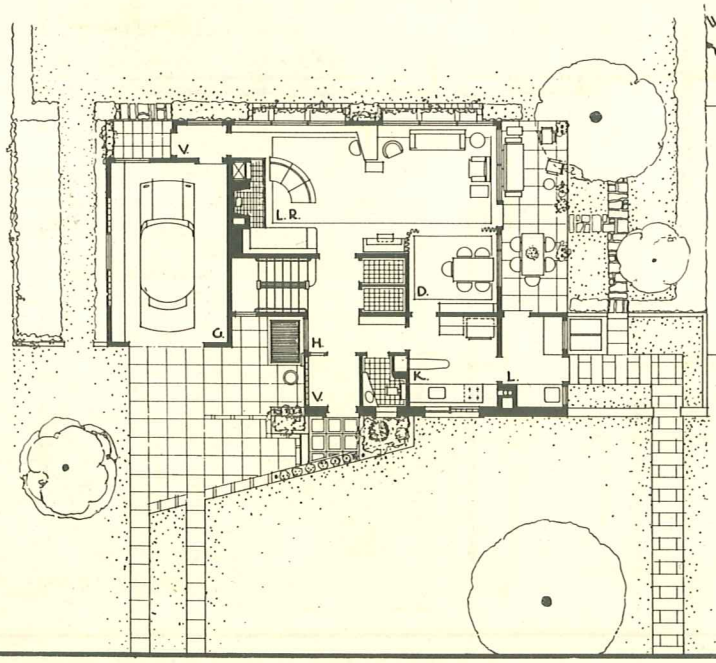
SECTION LOOKING EAST

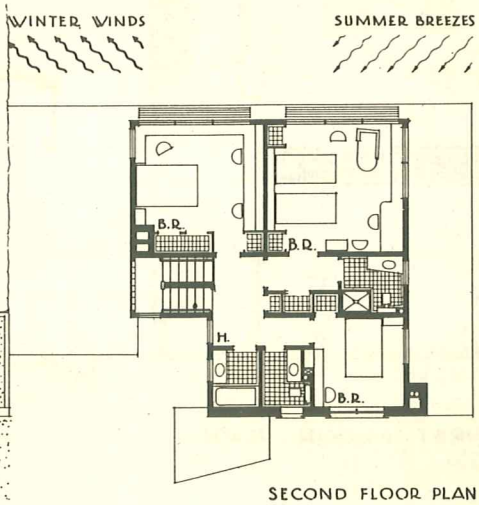


BASEMENT PLAN



ASH REMOVAL BY USE OF REMOVABLE BRACKET & TACKLE



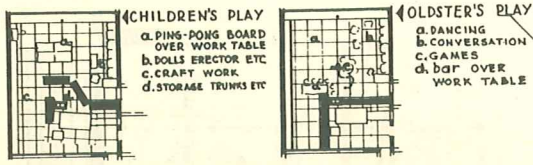


SECOND FLOOR PLAN

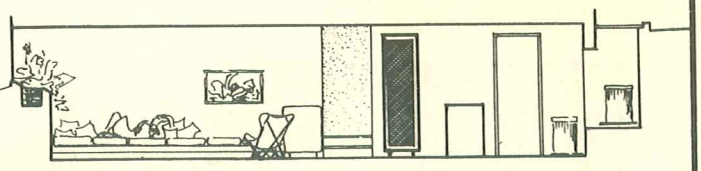
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HONORABLE MENTION

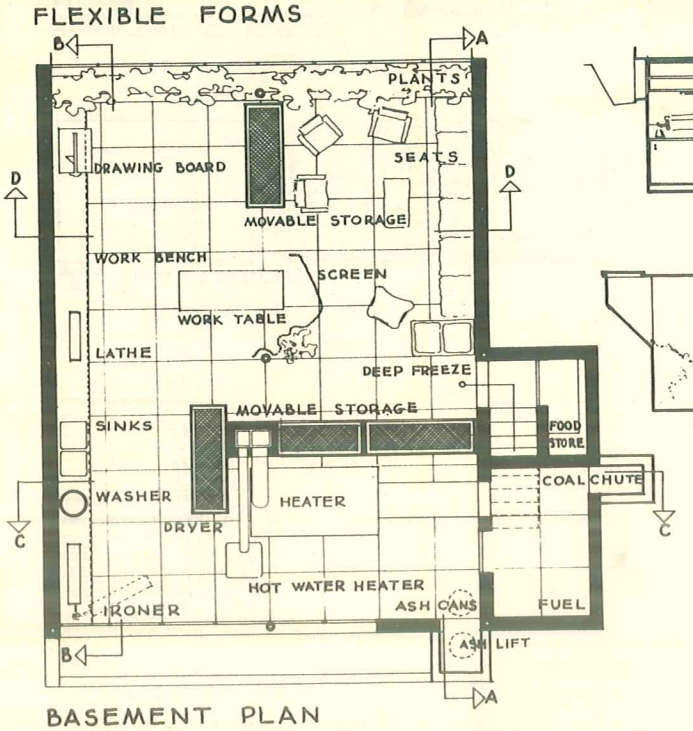
Architect: CHARLES K. HIRZEL, RICHMOND HILL, NEW YORK



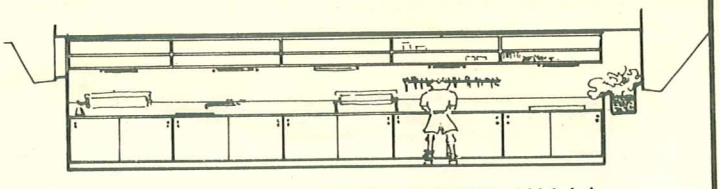
FLEXIBLE FORMS



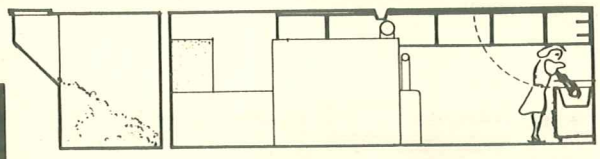
A-A WEST WALL



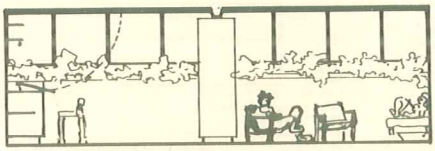
BASEMENT PLAN



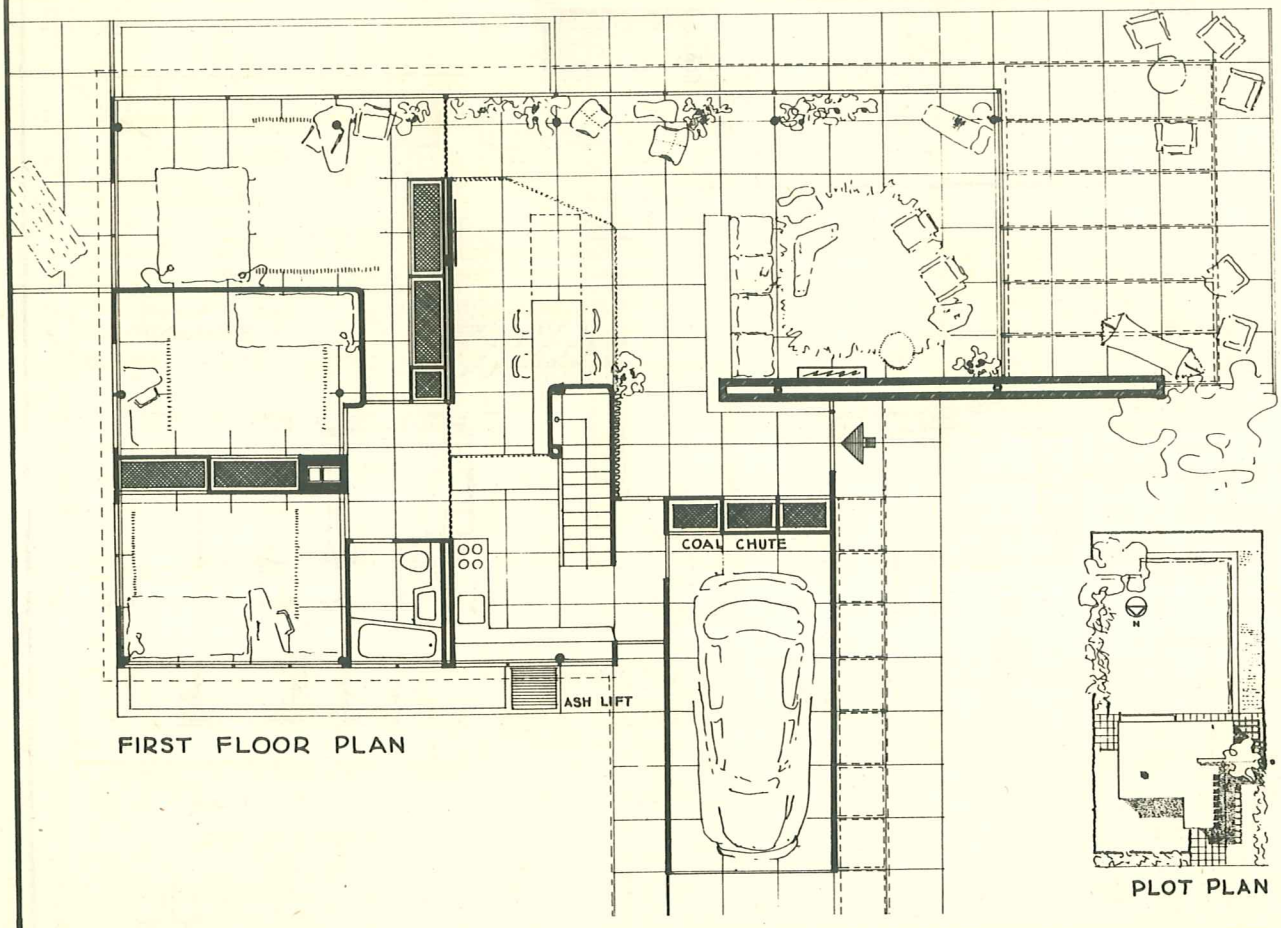
B-B EAST WALL



C-C NORTH WALL



D-D SOUTH WALL

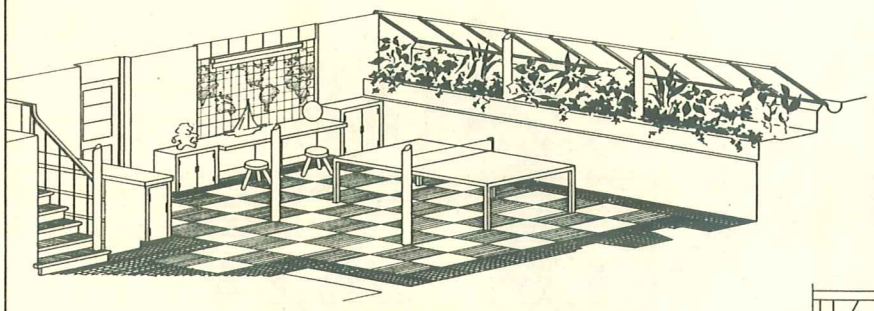


FIRST FLOOR PLAN

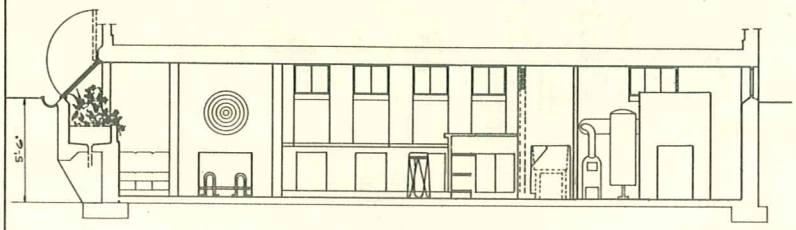
PLOT PLAN

HONORABLE MENTION

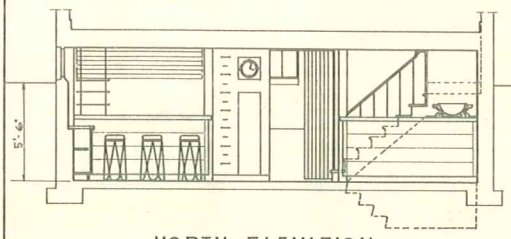
Architect: HENRY HEBBELN, NEW YORK, NEW YORK



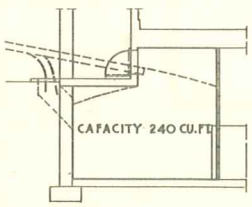
SOUTHEAST CORNER



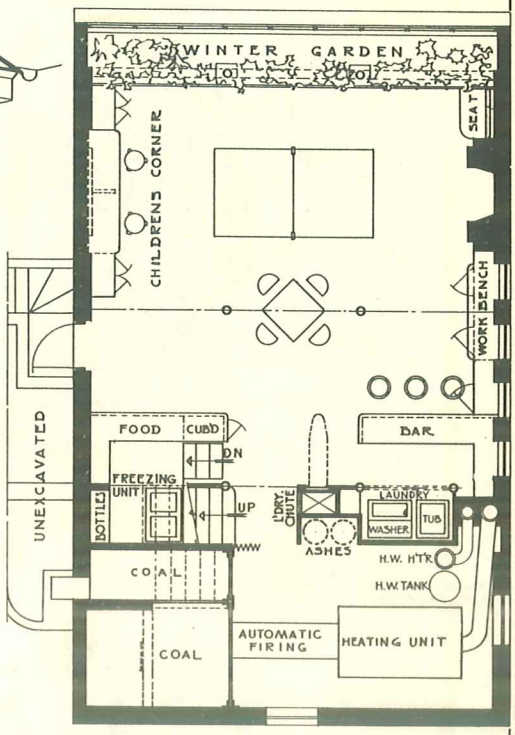
WEST ELEVATION



NORTH ELEVATION

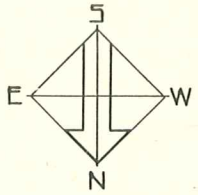


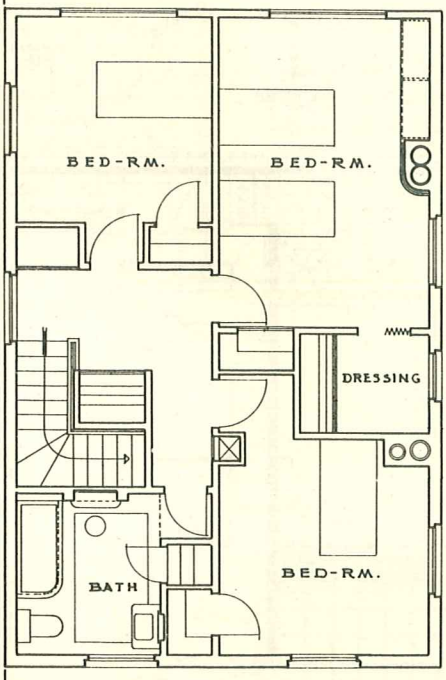
COAL DELIVERY



BASEMENT FLOOR

AREA - 22'-9" X 35'-2" = 800 SQ.FT.



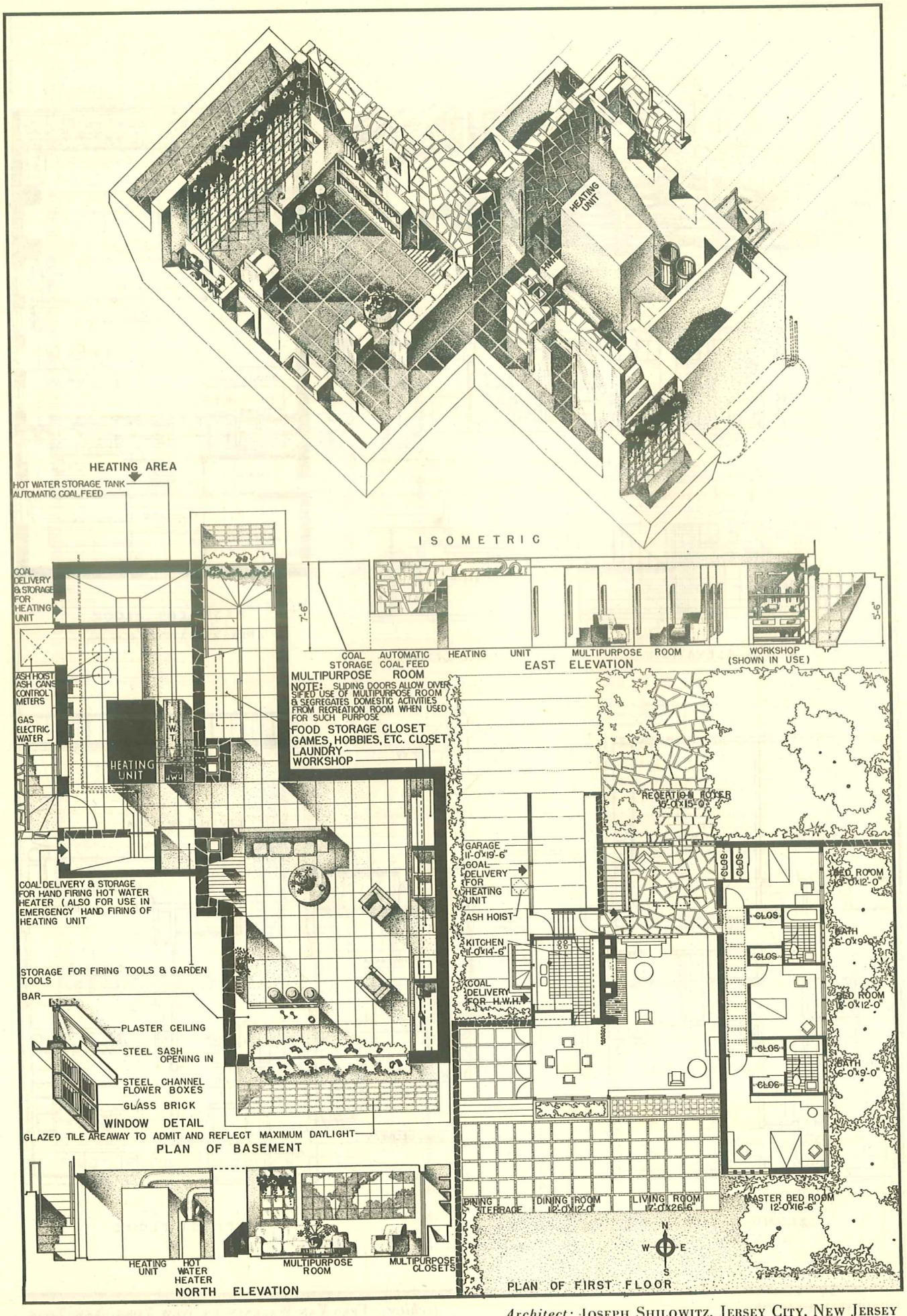


SECOND FLOOR

FIRST FLOOR

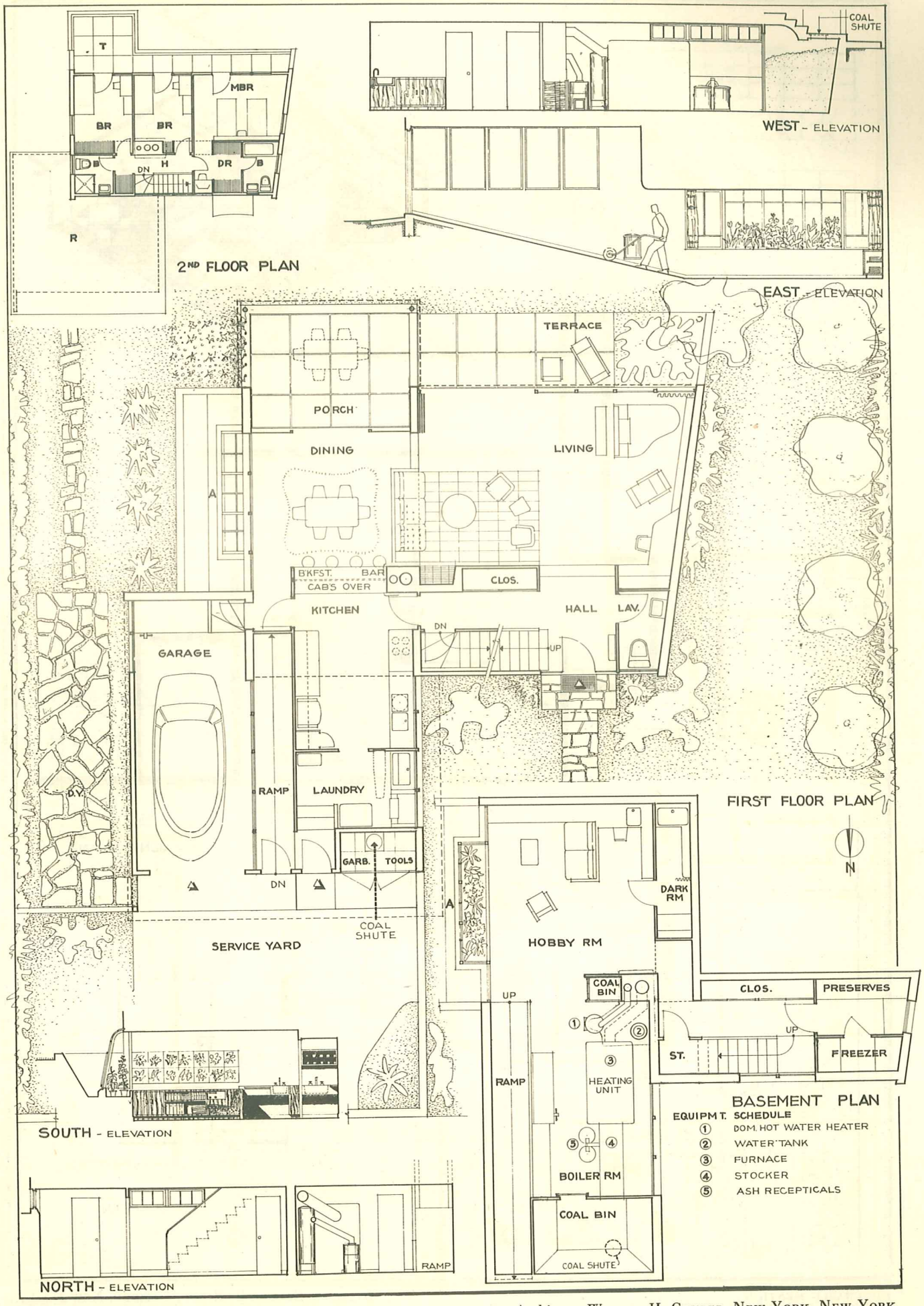
HONORABLE MENTION

Architect: FRED VAN WAGENINGEN, NEW YORK, NEW YORK



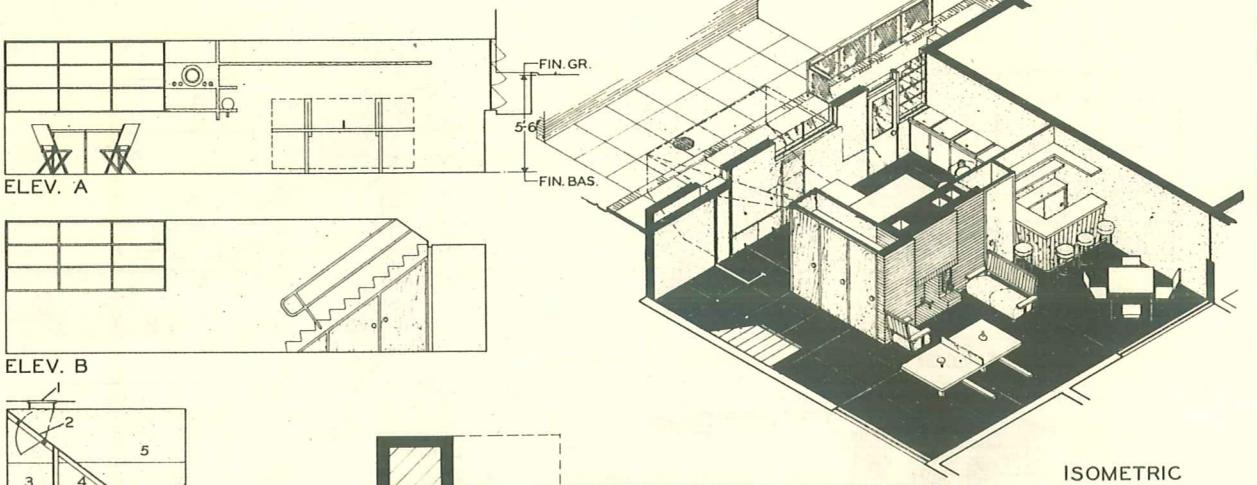
HONORABLE MENTION

Architect: JOSEPH SHILOWITZ, JERSEY CITY, NEW JERSEY



HONORABLE MENTION

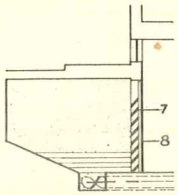
Architect: WALTER H. GRUBER, NEW YORK, NEW YORK



ELEV. A

ELEV. B

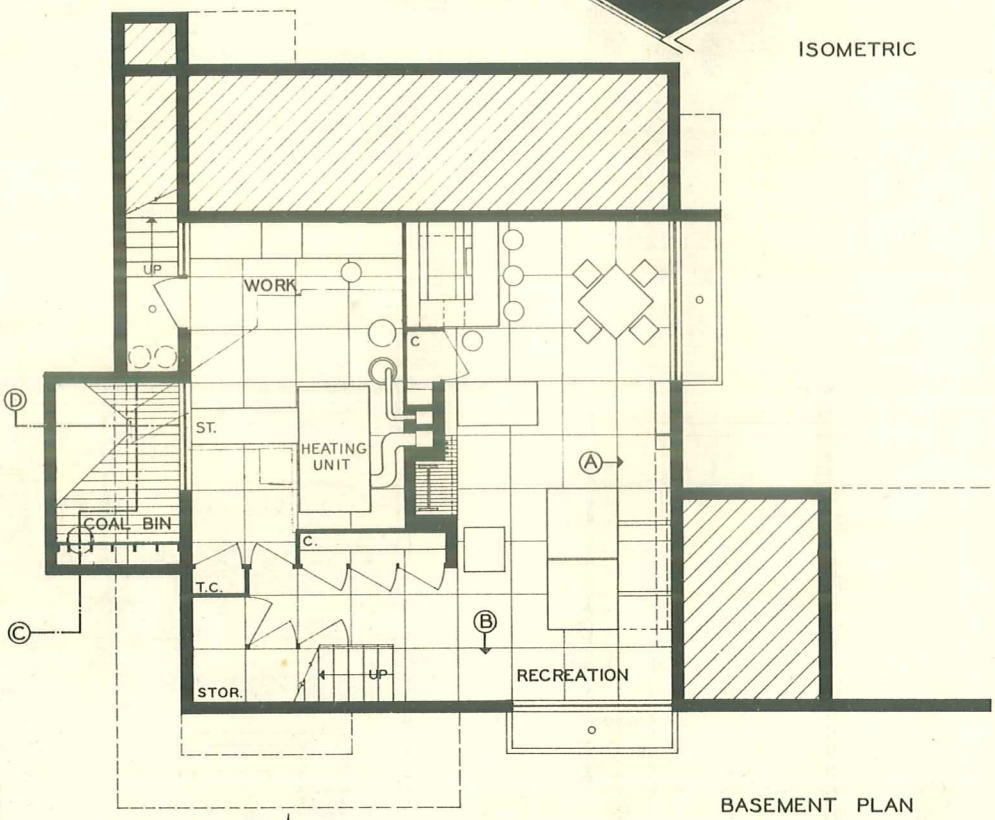
SECT. C



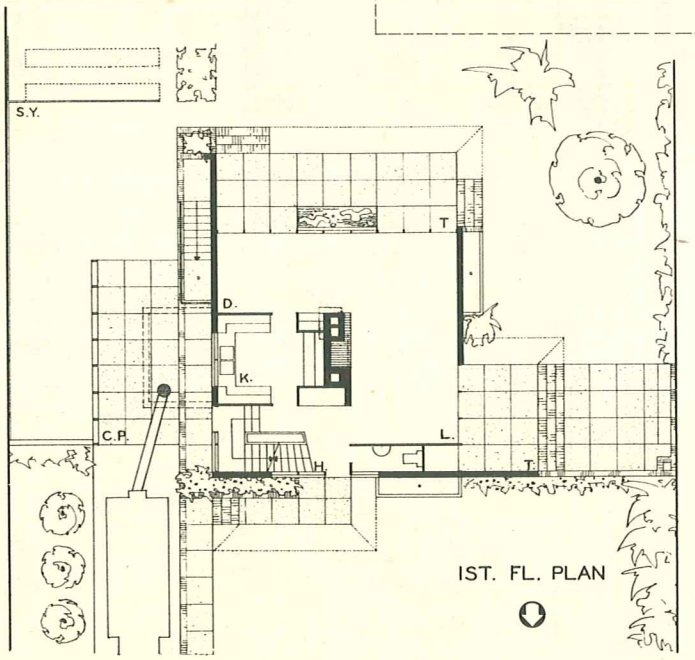
SECT. D

1-COAL CHUTE.
2-TRAP DOOR FOR SM. COAL.
3-SMALL COAL STORAGE.
4-WOOD STORAGE.
5-LARGE COAL STORAGE.
6-COAL STOKER FEED UNDER FLOOR.
7-REMOVABLE WOOD LOUVERS.
8-ACCESS DOOR.

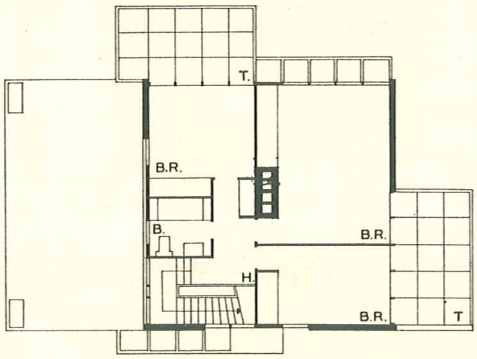
ISOMETRIC



BASEMENT PLAN



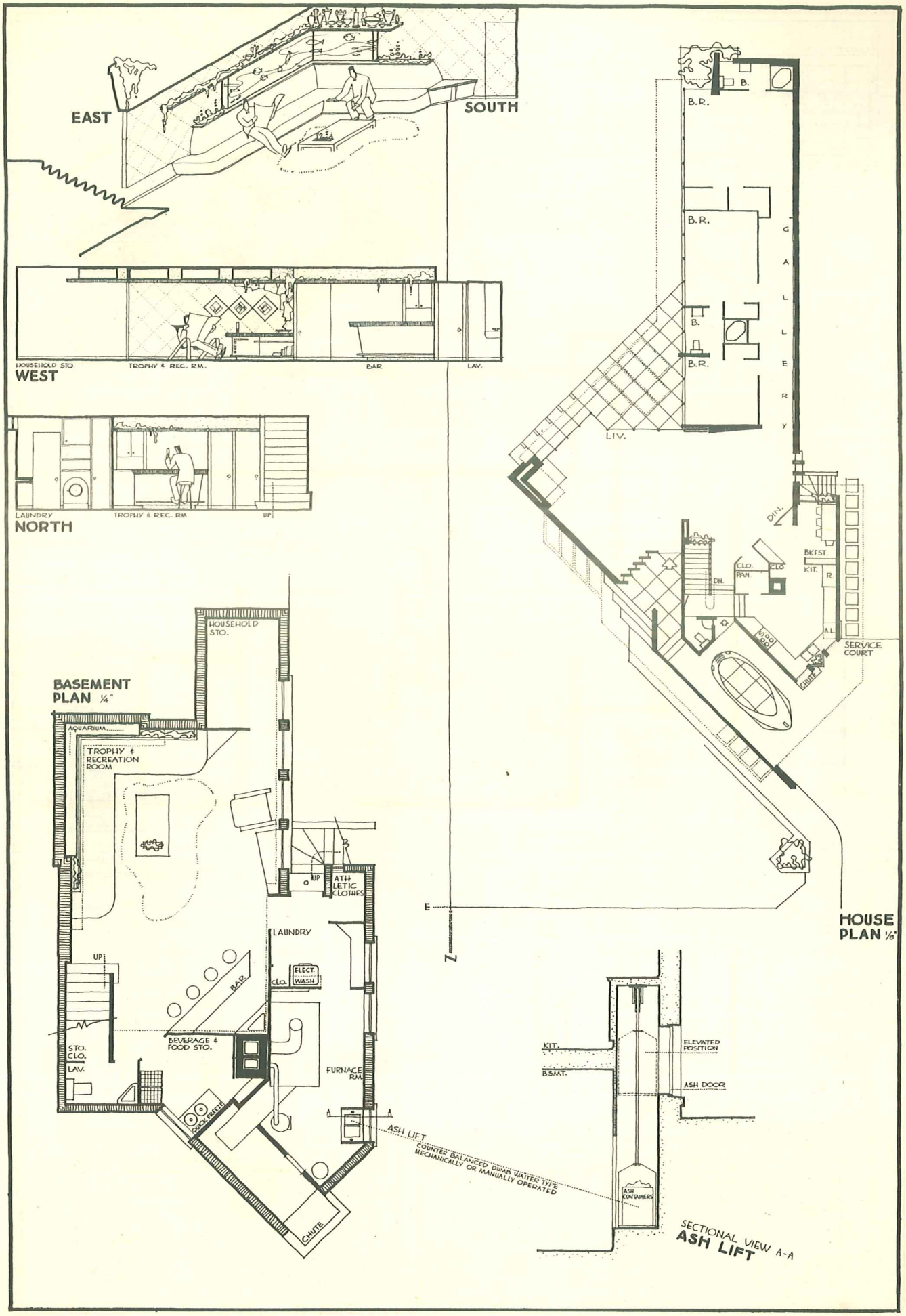
IST. FL. PLAN



2ND. FL. PLAN

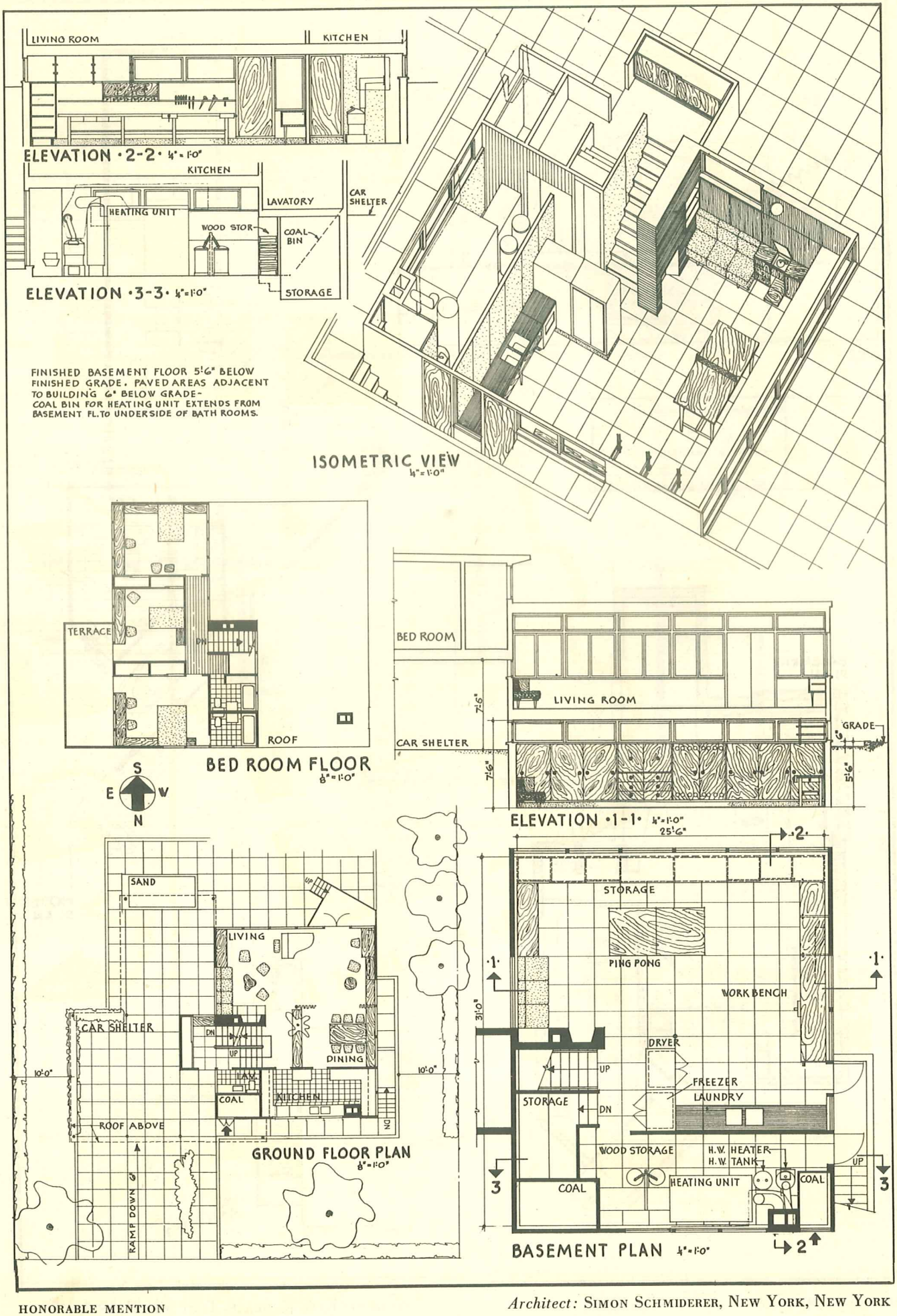
HONORABLE MENTION

Architect: GEORGE R. RUSSO, CAMDEN, NEW JERSEY



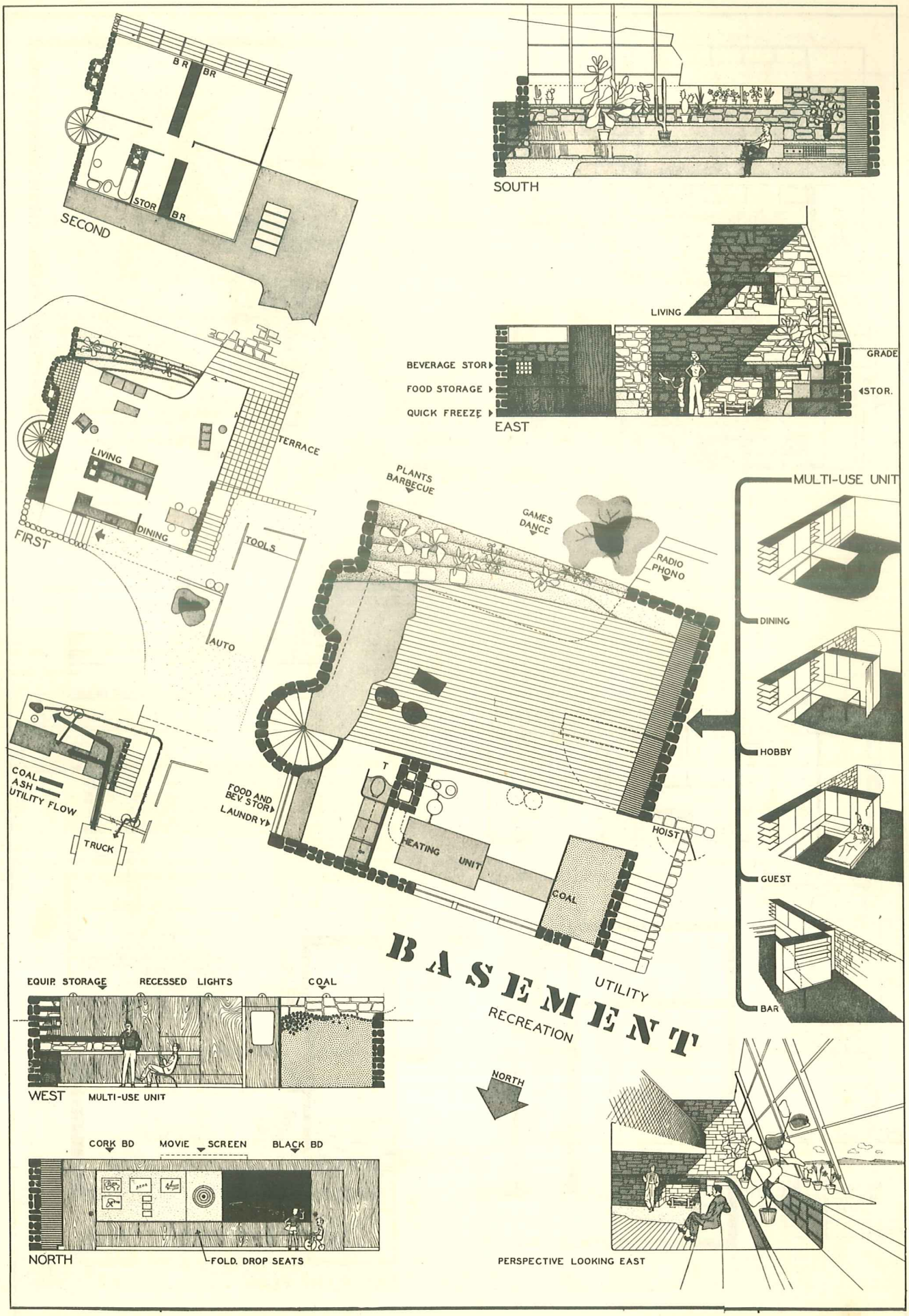
HONORABLE MENTION

Architect: KARL KAMRATH, FORT SAM HOUSTON, TEXAS



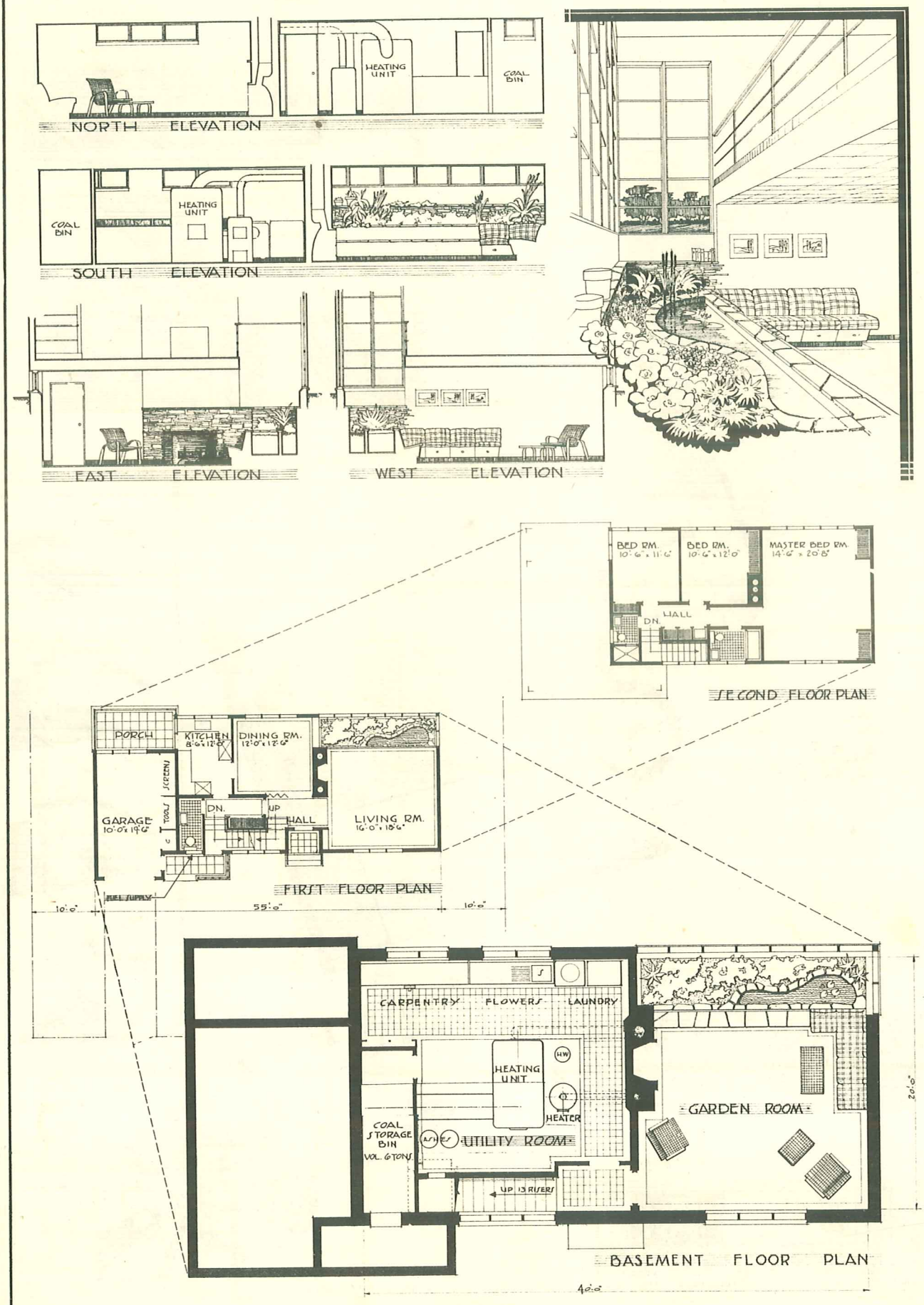
HONORABLE MENTION

Architect: SIMON SCHMIDERER, NEW YORK, NEW YORK



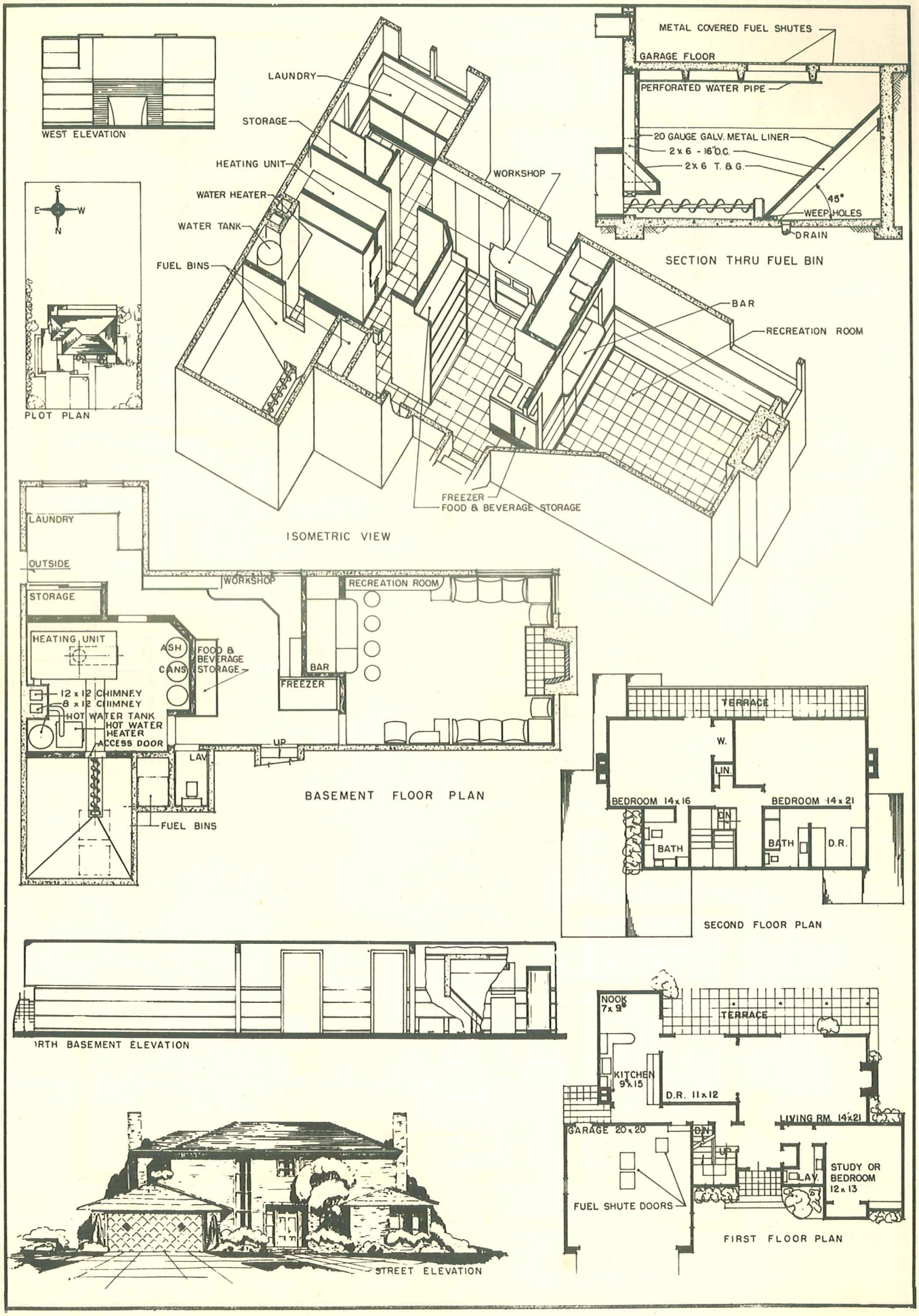
HONORABLE MENTION

Architect: THEODORE LUDEROWSKI, ALEXANDRIA, VIRGINIA



HONORABLE MENTION

Architect: WILLIAM D. BROWER, GLEN ROCK, NEW JERSEY



Architect: Alfred F. Simonson, Seattle, Washington

systems, identified as pressure, vapor, and vacuum. Water boilers are used on two types of heating systems, known as gravity and forced water circulation. In addition to these simple cycle heating systems, there are binary systems which combine the use of steam boilers and forced air circulation, incorporating the use of heat exchangers.

Space does not permit, nor is it necessary to discuss fully all of these kinds of heating units and systems, including air conditioning. The subject is amply covered in the A.S.H.V.E. Guide, which is published by the American Society of Heating and Ventilating Engineers, 51 Madison Avenue, New York City. It is sufficient to say here that all of the various types of coal-burning models of heating units have certain distinct advantages and are in popular demand. It is important, however, in the selection of any of this equipment, that for greater satisfaction liberal rather than minimum sizes be specified to meet the heating requirements.

THE STOKER—Truly one of the greatest contributions of this mechanical age is the household stoker. By and large it excels all other heating appliances in providing the most healthful and most economical heat. Approximately one million stokers were in use in the United States before the war.

Household stokers are manufactured in two general types, hopper and bin-feed. The former requires manual filling of the hopper; the latter is fed automatically by means of an extension of the stoker worm into the coal bin. Most of the bituminous stokers in use at present are the hopper-clinker variety. However, the next few years are expected to see a substantial increase in the use of stokers having both automatic coal-feed and automatic ash-removal features.

It is very important that the size of stoker be carefully selected to meet the load requirements of the boiler or furnace in a given dwelling. In this connection, designers should secure a copy of the Technical Manual containing Industry Standards, Recommended Practices and Technical Information, published by the Stoker Manufacturers Association, 307 North Michigan Avenue, Chicago 1, Illinois.

The table and explanatory notes on pages 26 and 27, taken from the manual, condense the major factors governing the selection and installation of stoker equipment.

THE CHIMNEY—In house construction there has been a tendency to skimp on the cross-sectional area and the height of chimneys. The additional cost of an adequate chimney, universally adapted to all types of fuels, is so small as to be insignificant in the total cost of a dwelling. Inasmuch as the average dwelling has a long life and there is likelihood that more than one type of fuel will be used over this long period, it is highly advantageous and prudent that all chimneys be designed with these facts in mind.

IMPORTANT ITEMS IN CHIMNEY CONSTRUCTION—Among other things the action of a chimney has a very distinct bearing on the ability of a heating boiler or furnace to perform up to capacity. A plant otherwise properly designed will fail to give satisfaction if the chimney cannot produce the draft necessary to burn the required amount of fuel and carry away the gaseous products of combustion.

"A chimney must not only be of adequate cross-sectional area and height but it must also be tight. Air leakage into the chimney will reduce the draft. There must be only a single smoke connection to each flue. (Note: Water heaters and fireplaces should always have separate and individual flues.) The chimney should be straight, without offsets to catch soot and ash collections,

and should extend at least 2 feet above the roof ridge or 3 feet above flat roofs. Account must be taken of the effect of adjacent higher portions of the building and nearby buildings and trees. Whenever possible the top of a chimney should be at least 35 feet above the grate level as chimneys of lower height are likely to be erratic in their action. CHIMNEYS BUILT IN THE INTERIOR OF THE STRUCTURE ARE MORE EFFECTIVE THAN THOSE EXPOSED TO THE COLD OUTSIDE AIR. Circular cross-sectional areas are the most desirable, square ones being second in desirability. The effective area of a square chimney may be taken as the area of a circle which may be inscribed within its internal cross-section. Rectangular chimneys offer greater frictional resistance to gas flow and allow greater losses of heat from the flue gases than those of other shapes. The ratio of the inside dimensions of rectangular chimneys should not exceed 2 to 1. Either fire brick or fire clay molded linings are desirable, and chimneys should be so constructed that in no way can they produce fire hazards."*

Reference is made again to the table on page 26 for additional data on draft and chimneys. Here it should be especially noted that the smallest size stoker (15 pounds of coal per hour) calls for a chimney with a minimum diameter of 10 inches and a minimum height of 35 feet.

THE COAL BIN—Because of coal's bulk and weight, the designer should approach the matter of coal storage and coal handling for the dwelling on a scientific basis. He should provide for a short, streamlined movement of the coal from truck to bin to heating plant. Adequate provision for handling and storing coal has often been overlooked in designing homes in the past. The savings to the prospective occupant of a home in time, labor, and expense of getting coal into the bin and thence into the firebox of the furnace or boiler, certainly warrant the small amount of attention necessary to insure ease in these essential functions.

The rules are simple:

1. The coal bin should be located so that the coal can be moved from the coal truck into the bin without having to be rehandled.
2. The bin should hold 5 tons or multiples of 5 tons.
3. All bins for coal that must be shoveled into the stoker hopper, or fired by hand in the furnace, should be sloped towards the coal outlet.
4. The coal bin may be placed under the driveway, inside the basement proper, or partly inside and partly outside the basement. If inside, the bin should extend from the basement floor to the ceiling and be dust-tight regardless of materials used in its construction.
5. The outlet of the bin should be located so that all the coal will flow towards it and so that coal may be shoveled directly into the furnace or stoker hopper.
6. For use with bin-feed stokers not having an auxiliary gathering worm, a hopper-type bottom in the coal bin will facilitate coal removal.

The coal bin must be located so that it is readily accessible from the private drive of the home owner or, in some cases, from the alley or street. If under the drive, one or more manholes may be installed which can be protected from surface water by raising them above the surface of the drive (between the automobile tracks) and the coal may be dumped directly into the bin. If located in the basement, a special metal coal-delivery window should be installed. Coal can be

(*Continued on page 28*)

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STOKER MANUFACTURERS ASSOCIATION

Load carrying capacities

Minimum furnace dimensions

Draft & chimneys for typical single retort underfeed stokers

A	B	C	D	E	F	G	H	J	K	L	M		
Coal Feed Pounds per hour	Net available Heat 1000's B.t.u. per hour	Boiler Horsepower 1 B.H.P. - 33,475 B.t.u. per hour	Direct standing radiation sq. ft. of steam	Direct standing radiation sq. ft. hot water	Setting Height Minimum Inches	Base Height Minimum Inches	Firebox Width Minimum Inches	Firebox Length Minimum Inches	Furnace volume Minimum cubic feet	Overfire draft Minimum Inches of water	Minimum Recommended Chimney sizes from ASH & VE (H) and Kent's (K) table		
											Inside Dimensions of Rectangular Flue, Inches	Diameter of Round stack, in.	Height above Stoker, Feet
15	117	3.5	366	585	17½	11½	16½	17	3	.042	H 7 x 11½	10	35
20	156	4.7	487	780	18	11¾	17¾	19	4	.042	H 7 x 11½	10	35
25	195	5.8	609	975	18½	12	19	21	5	.043	H 7 x 11½	10	35
30	234	7.0	732	1170	19¼	12	20	23	6	.043	H 7 x 11¼	10	35
35	273	8.2	853	1365	19¾	12	21	24½	7	.044	H 11¼ x 11¼	12	40
40	312	9.3	975	1560	20¼	12¼	22	26¼	8	.044	H 11¼ x 11¼	12	40
50	390	11.6	1219	1950	21½	12½	24	29½	10	.045	H 11¼ x 11¼	12	40
60	468	14.0	1462	2340	22½	12¾	26	32¼	12	.046	H 11¼ x 16¼	12	40
75	585	17.4	1828	2925	24	13	29	36½	15	.047	H 11¼ x 16¼	12	40
100	780	23.3	2437	3900	27	14	33	42½	20	.050	H 17¼ x 17¼	18	45
150	1260	37.5	3937	6300	28½	14½	35	45½	30	.055	H 17 x 21	20	50
200	1680	50.2	5250	8400	30	15	37	47	40	.059	H 21 x 21	20	55
250	2100	63.7	6562	10500	31½	15	39	51	50	.064	H 24 x 24	22	60
300	2520	75.3	7875	12600	33	15½	41	53½	60	.068	H 24 x 24	24	65
350	2940	87.8	9187	14700	34½	16	43	56	70	.073	H 27 x 27	30	65
400	3360	100.	10500	16800	36	16¼	45	58½	80	.077	H 27 x 27	30	65
500	4200	125.	13125	21000	39	17	49	63	100	.087	K 30 x 30	33	70
600	5040	150.	15750	25200	42	18	53½	67½	120	.096	K 32 x 32	36	70
750	6300	188.	19687	31500	46½	19	59½	73½	150	.109	K 35 x 35	39	70
800	6720	200.	21000	33600	48	19¼	61½	75¾	160	.114	K 35 x 35	39	70
1000	8400	251.	26250	42000	54	21	68½	83	200	.132	K 38 x 38	42	95
1200	10080	301.	31500	50400	60	22½	72	87	240	.150	K 43 x 43	48	80

STOKER MANUFACTURERS ASSOCIATION

Notes applying to table on preceding page

A Loads given in tables are based on coal having a heat value of 12,000 B.t.u. per lb. To find load carrying capacities with coal having a different heating value multiply loads in table by factors given below.

Load values given in tables are based on combined efficiencies, boiler & stoker, of 65% to and including 100 lb. per hr., and 70% for those stokers over 100 lb. per hour.

B Output at boiler nozzle or furnace bonnet.

C Output at boiler nozzle. For heating loads only.

For power or process loads where boilers freuently are operated on loads in excess of rating, consult manufacturer regarding stoker size and setting,

D Based on emission per sq. ft. of standing radiation of 240 B.t.u. + 33 percent for piping and pickup = 320 B.t.u. per sq. ft. per hr., total load.

E Based on emission per sq. ft. of standing radiation of 150 B.t.u. + 33 percent for piping and pickup = 200 B.t.u. per sq. ft. per hr., total load.

At 65% efficiency, 1 lb. of coal per hour will supply 24.365 sq. ft. steam: 39 sq. ft. hot water direct standing radiation or 0.233 boiler horsepower = 4.292 lb. coal per boiler horsepower hour.

At 70% efficiency, 1 lb. of coal per hour will supply 26.25 sq. ft. steam: 42 sq. ft. hot water direct standing radiation or 0.250 boiler horsepower = 3.985 lb. coal per boiler horsepower hour.

F For steel boilers, dead plates or hearth to crown. Use ⅞ of heights shown in table for cast iron boilers. These heights do not apply to anthracite stokers. No minimum heights are specified for anthracite.

G Floor to bottom line of waterleg.

H For anthracite stokers not equipped with provisions for mechanical trimming the minimum firebox dimensions (length or width) should be 2 inches greater than shown for stokers up to 20 lb. per hr. capacity and 3 inches greater for stokers of from 21 lb. to 100 lb. per hour.

J Same as H.

K Based on a maximum heat release of 60,000 B.t.u. per cu. ft. per hr. for coals of 12,000 B.t.u. per lb. This is equivalent to 5 pounds of coal per cu. ft. per hr. Use factors under "A" for furnace volume with coal of other heat value. No minimum furnace volumes are specified for anthracite.

No combination of firebox dimensions which will result in furnace volumes less than specified in tables should be used.

L Measured with draft gage when stoker is running at maximum capacity.

M From ASH & VE & Kent's tables. Consult these tables for equivalent chimney sizes. Chimney should be adequate to supply draft called for in tables when stoker is operating at rated capacities.

Factors for load and furnace volume for coals of other than 12,000 B.t.u. per pound

B.t.u./lb.	Factors	B.t.u./lb.	Factors
9000	x0.75	11500	x0.96
9500	0.79	12500	1.04
10000	0.83	13000	1.08
10500	0.87	13500	1.12
11000	0.92	14000	1.17

delivered from a truck quickly and easily if the coal-delivery window is so placed that the truck can be coupled to it by means of a power-driven conveyor.

The size of the average coal truck has a lot to do with the location of the coal window or manhole, as the case may be. The average coal truck is about 9 feet high and when it is raised to allow the coal to flow out, it becomes about 12 or 15 feet high. Obviously, it cannot be raised and dumped inside the average garage or under a portico. The coal manhole or window should not be at the back of the garage or anywhere where it cannot readily be reached from outdoors by a conveyor 10 or 12 feet long.

SIZE OF BIN—Once the general location of the bin is determined, the next point is its size, or capacity. The average coal truck will hold about 5 tons of coal. The capacity of the coal bin, then, should be in multiples of 5 tons. The size of the bin depends upon the number of rooms to be heated, and a ton of bin capacity per room to be heated is a good minimum. It takes about 40 cubic feet to hold a ton of coal, so the minimum capacity of the coal bin for a small house should be at least 200 cubic feet. Thus a bin 6 feet square, filled to the depth of approximately 5½ feet, would hold 5 tons of coal. If a larger size bin can be installed, one 8½ feet square, for example, which would hold 10 tons of coal, so much the better. Too many present-day bins are long and narrow and difficult to fill. This type of bin is very much less practical than the bin which is approximately square. Round bins, which usually are made of metal, as well as rectangularly shaped metal bins or hyperbolic-shaped bins, can be used. These odd-shaped bins are considerably less attractive in appearance than the square or rectangular bins, which blend into the basement walls much better. All types of bins should reach the basement ceiling and be dust-tight.

MATERIAL FOR THE BIN—The most satisfactory way of building a coal bin in a new home is to cast it of concrete when the foundation is poured. Concrete or cinder blocks can be used to make a coal bin. If wood is used, the studding should be placed on 18″ centers and anchored to the ceiling joists and to the floor. The inside of the bin should be lined with tongue-and-groove lumber, 1″ x 6″ or 1″ x 4″, or shiplap may be used. It is suggested that if shiplap is used, a liner of building paper be placed between the studding and the shiplap as a seal in case of warpage. The outside of such a coal bin should be lathed and plastered so that it will blend harmoniously with the rest of the basement.

THE COAL BIN DOOR—For good appearance, a standard door and casing should be installed on the outside of the bin, with crossboards to retain the coal. Using a shovel box opening at floor level, there is little reason for taking these crossboards off, but they should be installed in slots or hinged, to facilitate removal. Boards 2 inches thick will keep dust from coming through. The same thing may be accomplished by using tongue-and-groove material, although this is harder to keep in place. The coal bin opening should be reasonably close to the hand-fired plant or the stoker hopper and it is better to have it in the middle of one side of the bin rather than at a corner.

In the case of the bin-feed stoker where the worm comes out of the bin above the floor (the worm can be buried in the floor if desired) the worm outlet should be boxed in and the ordinary door placed above it with crossboards to retain the coal in the bin. Piping and ducts should not enter the coal bin, to avoid obstruction and fire hazard.

Relative location of the elements

The following should serve as a good general guide to architects in laying out the complete heating plant:

The coal bin should be located as near the driveway as possible.

The hand-fired heating unit should be located within approximately 6 feet of the coal bin outlet, and the firing door conveniently located with respect to it. If the heating unit includes a hopper-type stoker, the unit should be located so that the hopper will be most convenient to the coal bin outlet; however, enough clearance should always be allowed to provide for the withdrawal of the stoker worm from its housing without dismantling the stoker proper.

If the heating unit includes a bin-feed stoker, the location of the unit will vary with respect to the coal bin according to the position of the worm-driving mechanism. The extension worm for these stokers should be laid out in multiples of 3 feet, as that is the length of a standard section.

The smoke outlet of the heating unit should be located not over 10 feet from the chimney, and preferably less, with as few piping turns as possible.

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